FIG. 1

```
                   .         .         .         .
SP22       MASKRALVILAKGAEEMETVIPVDIMRRAGIKVTVAGLAG
       1   ||||||||||||||||||||||||:|||||||||||||||    40
DJ-1       MASKRALVILAKGAEEMETVIPVDVMRRAGIKVTVAGLAG
                                        Peptide 1

                   .         .         .         .
SP22       KDPVQCSRDVVICPDTSLEEAKTQGPYDVVVLPGGNLGAQ
      41   |||||||||||||||:|||:|| :||||||||||||||||    80
DJ-1       KDPVQCSRDVVICPDASLEDAKKEGPYDVVVLPGGNLGAQ

                   .         .         .         .
SP22       NLSESALVKEILKEQENRKGLIAAICAGPTALLAHEVGFG
      81   ||||||:|||||||||||||||||||||||||||||:| |    120
DJ-1       NLSESAAVKEILKEQENRKGLIAAICAGPTALLAHEIGCG
                    Peptide 2

               *   .         .         .         .
SP22       CKVTSHPLAKDKMMNGSHYSYSESRVEKDGLILTSRGPGT
     121   :|||:||||||||||| ||:||| ||||||||||||||||    160
DJ-1       SKVTTHPLAKDKMMNGGHYTYSENRVEKDGLILTSRGPGT
              Peptide 3                   Peptide 4

                   .         .
SP22       SFEFALAIVEALSGKDMANQVKAPLVLKD
     161   |||||||||||| ||::| ||||||||||               189
DJ-1       SFEFALAIVEALNGKEVAAQVKAPLVLKD
```

FIG. 2

```
1     A gctgtgcagagccgtctggcagggttgacctcctaaagggatattccatctttattaatcattag 65

66    A tagtgtggtcagagacttagcaccattggtctcccccaacctggtccagacatttcagcagttta 130

131   A tcggaacagcaacaacagcaacaaaaccttcaaaatttacaagtctttaagaaatagaaATGgca 195
      B          tggcttcgcgtgggtggaggaggcgcggctgcaggtctttaagaaatagaaATGgca
      C               ttgaacctATGttgcactgtggagttctccacttacacagcctatttatggca
1                               M  L  H  C  G  V  L  H  L  H  S  L  F  M  A  15

196     tccaaaagagctctggtcatcctagccaaaggagcagaggagatggagacagtgattcctgtgga 260
16       S  K  R  A  L  V  I  L  A  K  G  A  E  E  M  E  T  V  I  P  V  D 37

261     catcatgcggcgagctgggattaaagtcaccgttgcaggcttggctgggaaggaccccgtgcagt 325
38        I  M  R  R  A  G  I  K  V  T  V  A  G  L  A  G  K  D  P  V  Q  58
                                          Peptide 1

326     gtagccgtgatgtagtgatttgtccggataccagtctggaagaagcaaaaacacagggaccatac 390
59      C  S  R  D  V  V  I  C  P  D  T  S  L  E  E  A  K  T  Q  G  P  Y  80

391     gatgtggttgttcttccaggaggaaatctgggtgcacagaacttatctgagtcggctttggtgaa 455
81       D  V  V  V  L  P  G  G  N  L  G  A  Q  N  L  S  E  S  A  L  V  K 102

456     ggagatcctcaaggagcaggagaacaggaagggcctcatagctgccatctgtgcgggtcctacgg 520
103       E  I  L  K  E  Q  E  N  R  K  G  L  I  A  A  I  C  A  G  P  T   123
           Peptide 2
                                                                 *
521     ccctgctggctcacgaagtaggctttggatgcaaggttacatcgcacccattggctaaggacaaa 585
124     A  L  L  A  H  E  V  G  F  G  C  K  V  T  S  H  P  L  A  K  D  K  145
                                                   Peptide 3

586     atgatgaacggcagtcactacagctactcagagagccgtgtggagaaggacggcctcatcctcac 650
146      M  M  N  G  S  H  Y  S  Y  S  E  S  R  V  E  K  D  G  L  I  L  T 167
                                                              Peptide 4

651     cagccgtgggcctgggaccagcttcgagtttgcgctggccattgtggaggcactcagtggcaagg 715
168       S  R  G  P  G  T  S  F  E  F  A  L  A  I  V  E  A  L  S  G  K   188

716     acatggctaaccaagtgaaggccccgcttgttctcaaagacTAGagagcccaagccctggaccct 780
189     D  M  A  N  Q  V  K  A  P  L  V  L  K  D  *                       202

781     ggacccccaggctgagcaggcattggaagcccactagagagaccacagcccagtgaacctggcat 845

846     tggaagcccactagtgtgtccacagcccagtgaacctcaggaactaacgtgtgaagtagcccgct 910

911     gctcaggaatctcgccctggctctgtactattctgagccttgctagtagaataaacagttcccca 975

976     agctc*c*tgacggct*                                                 989
```

**Fig. 3**

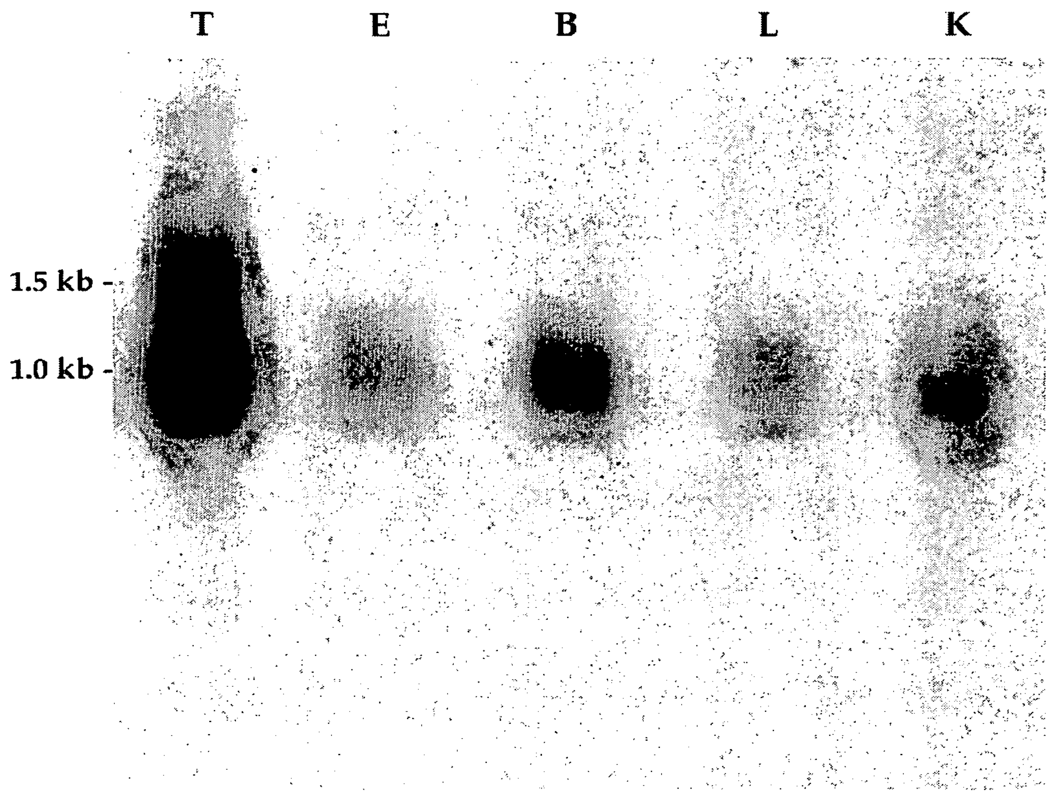


**Fig. 4**

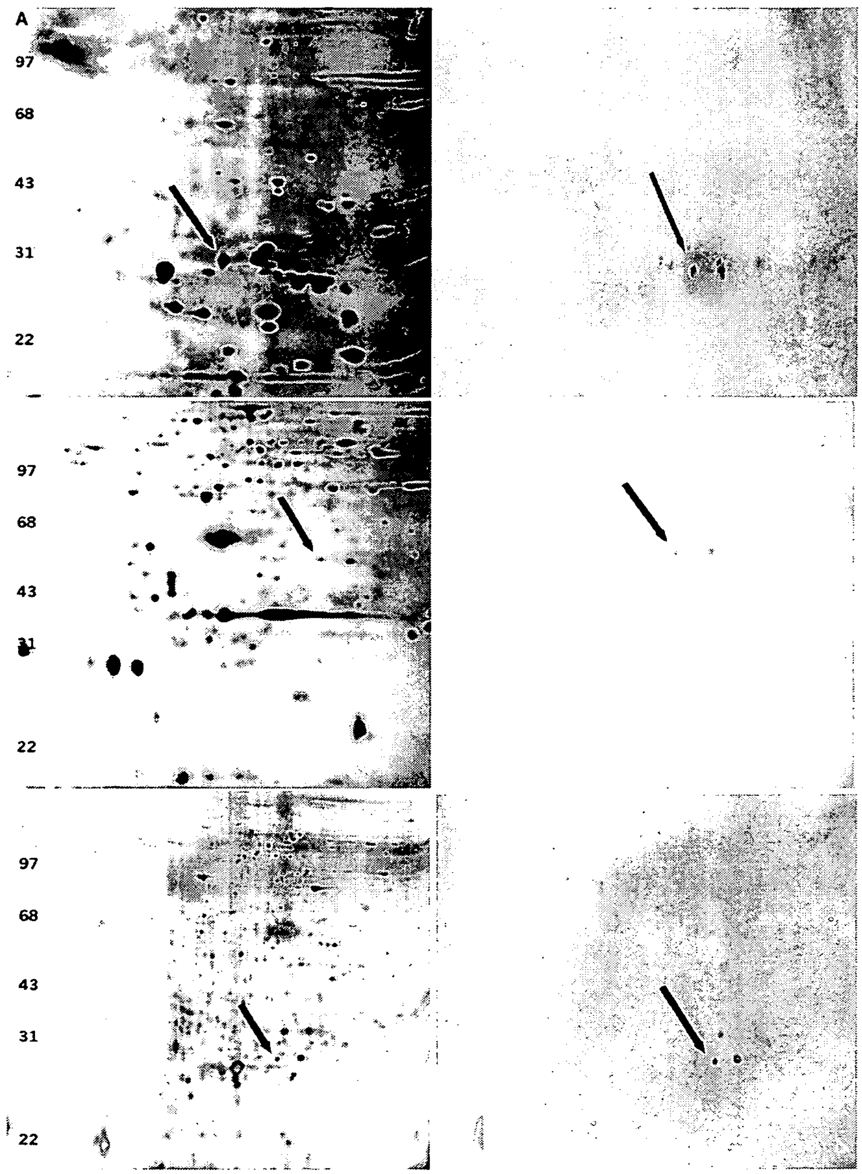


**Fig. 5**

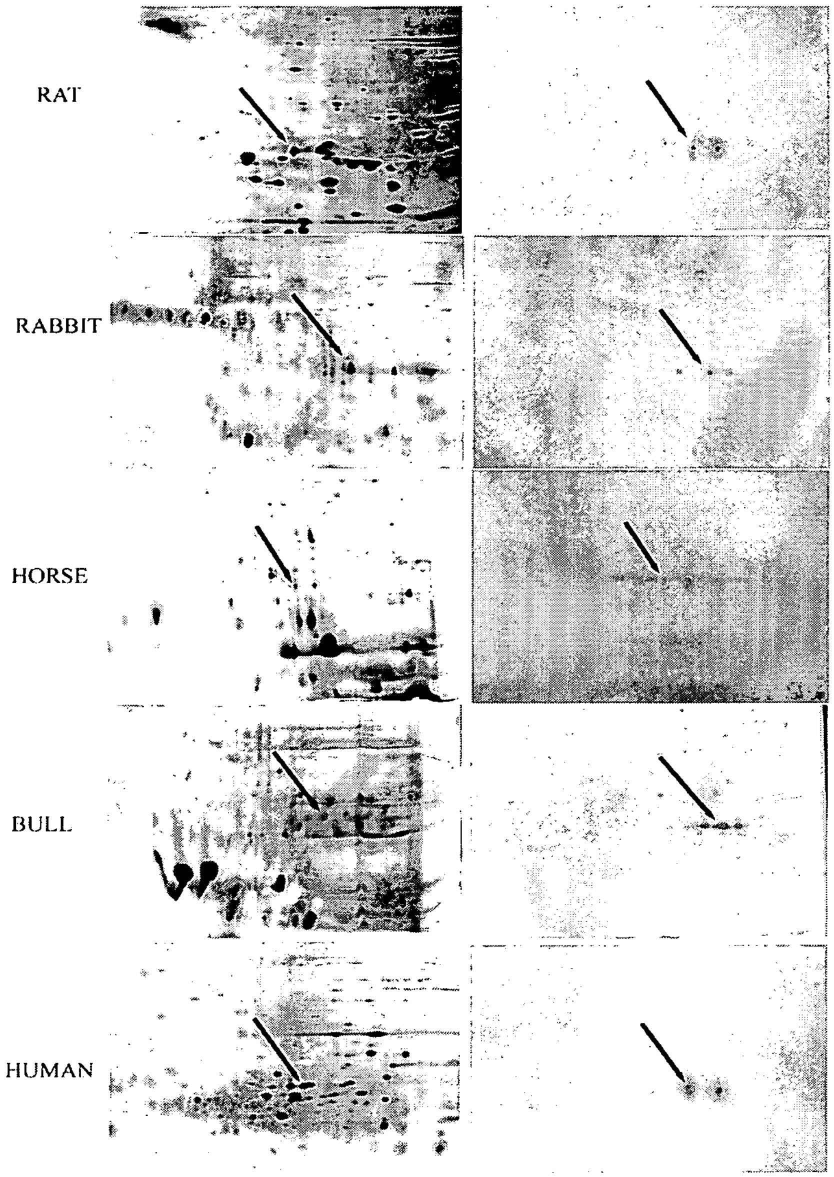
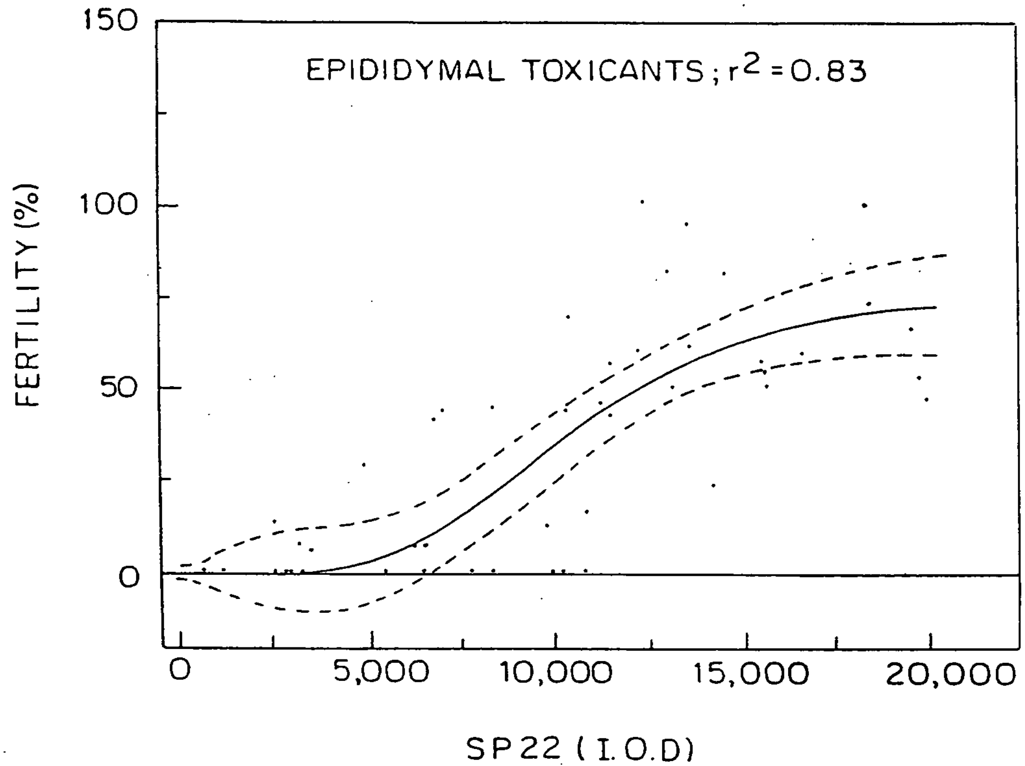
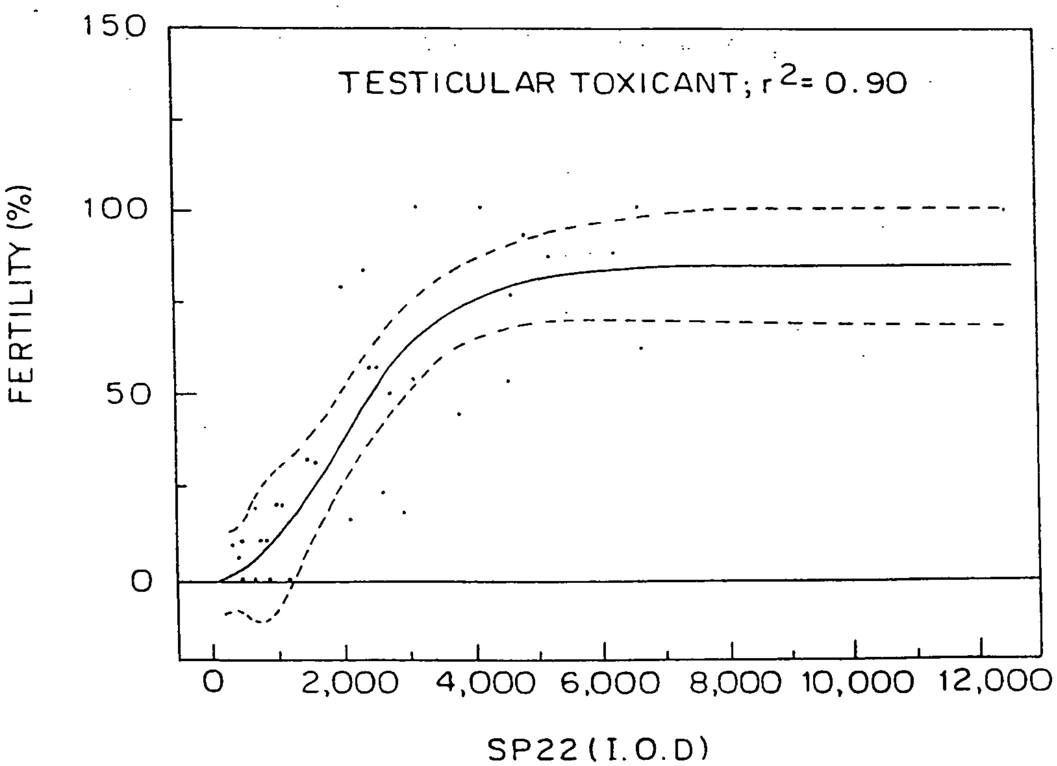
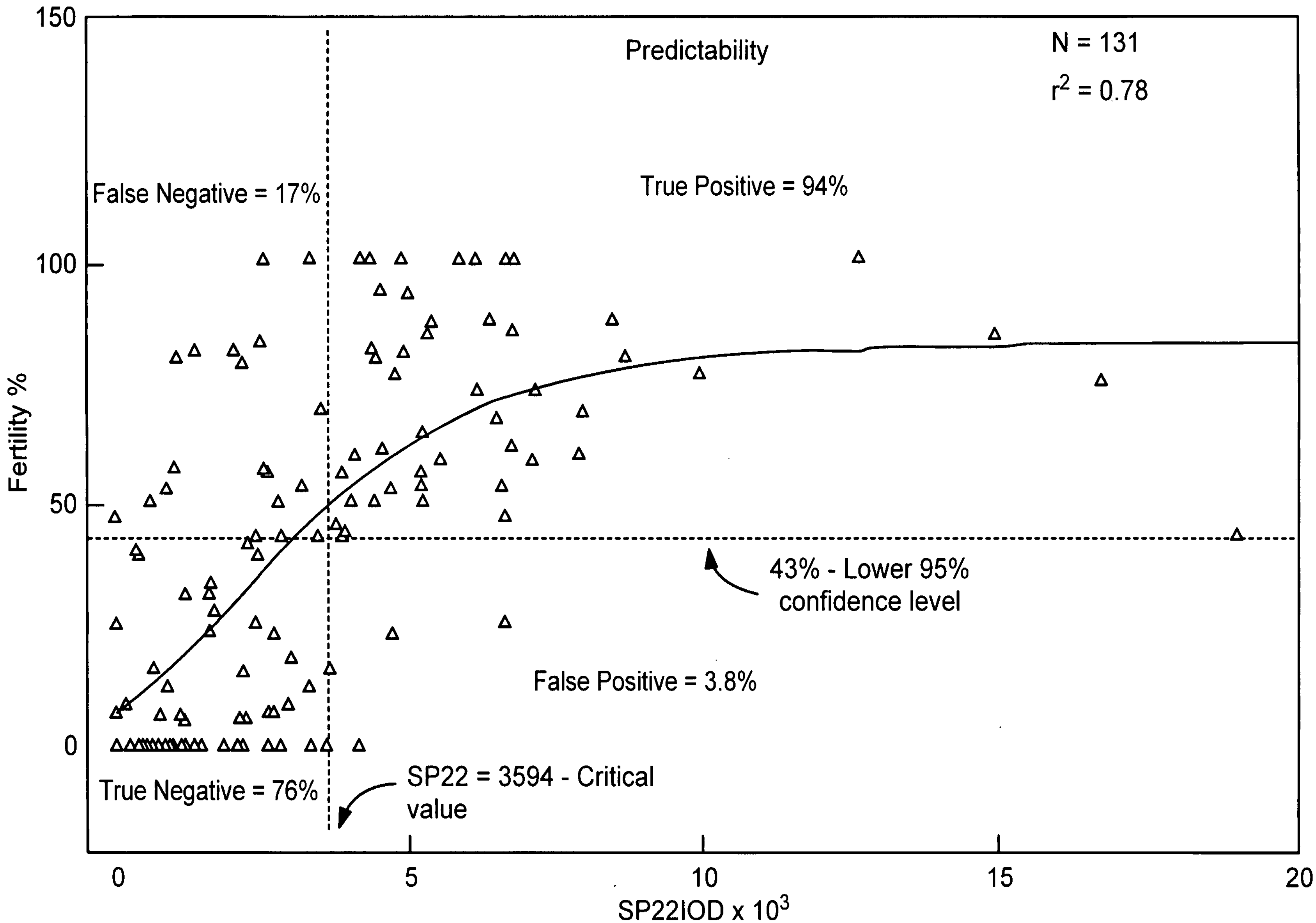


FIG. 6


EPIDIDYMAL TOXICANTS; $r^2$ = 0.83
150
100
50
0
FERTILITY (%)
0
5,000
10,000
15,000
20,000
SP22 (I.O.D)


TESTICULAR TOXICANT; $r^2$ = 0.90
150
100
50
0
FERTILITY (%)
0
2,000
4,000
6,000
8,000
10,000
12,000
SP22 (I.O.D)



Fertility %
150
100
50
0
0
5
10
15
20
SP22IOD x 10^3
Predictability
N = 131
r^2 = 0.78
False Negative = 17%
True Positive = 94%
43% - Lower 95% confidence level
False Positive = 3.8%
True Negative = 76%
SP22 = 3594 - Critical value


FIG. 7

FIG. 8-1

FIG. 8-2

FIG. 8-3

FIG. 8

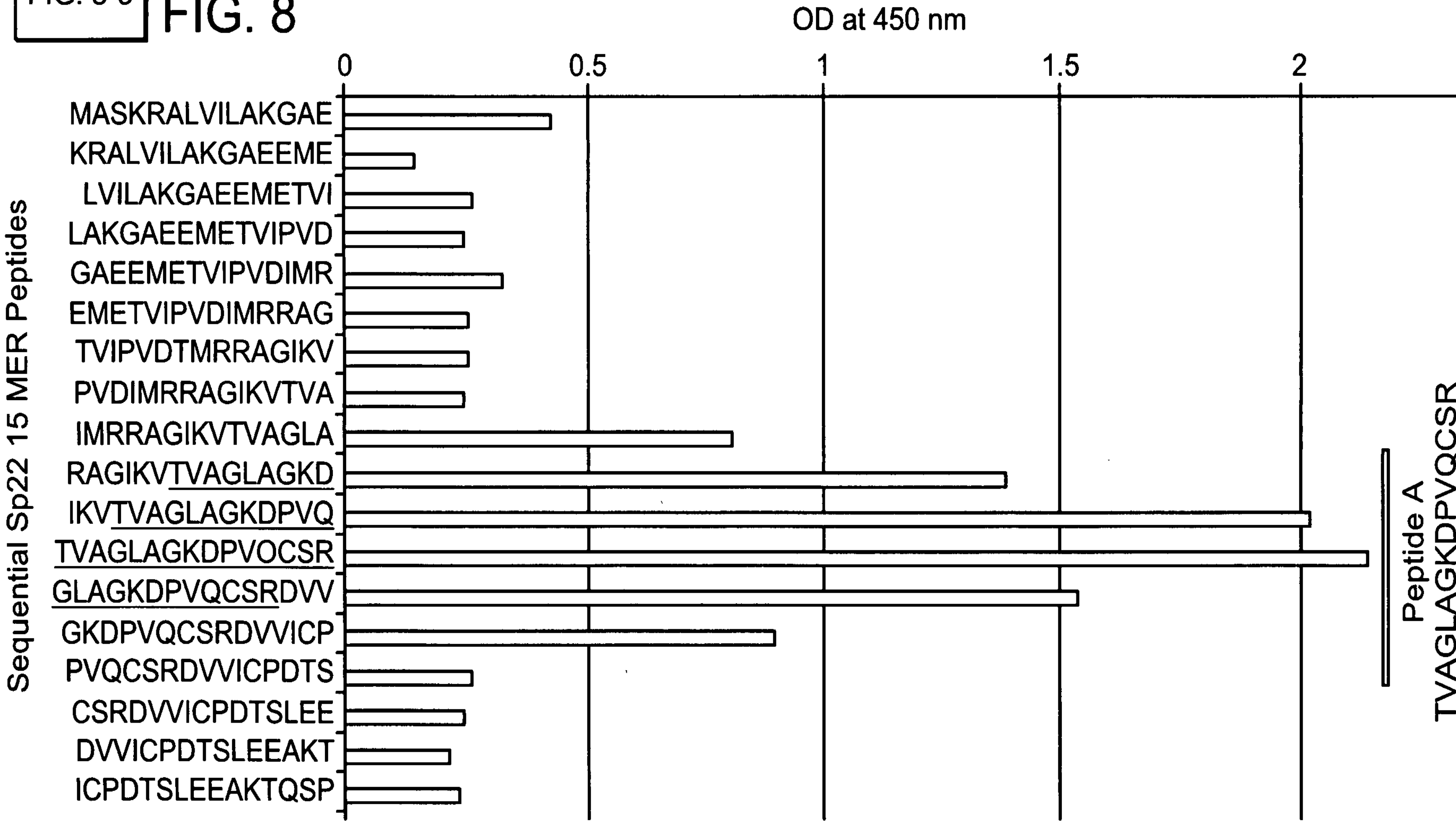



FIG. 8-1

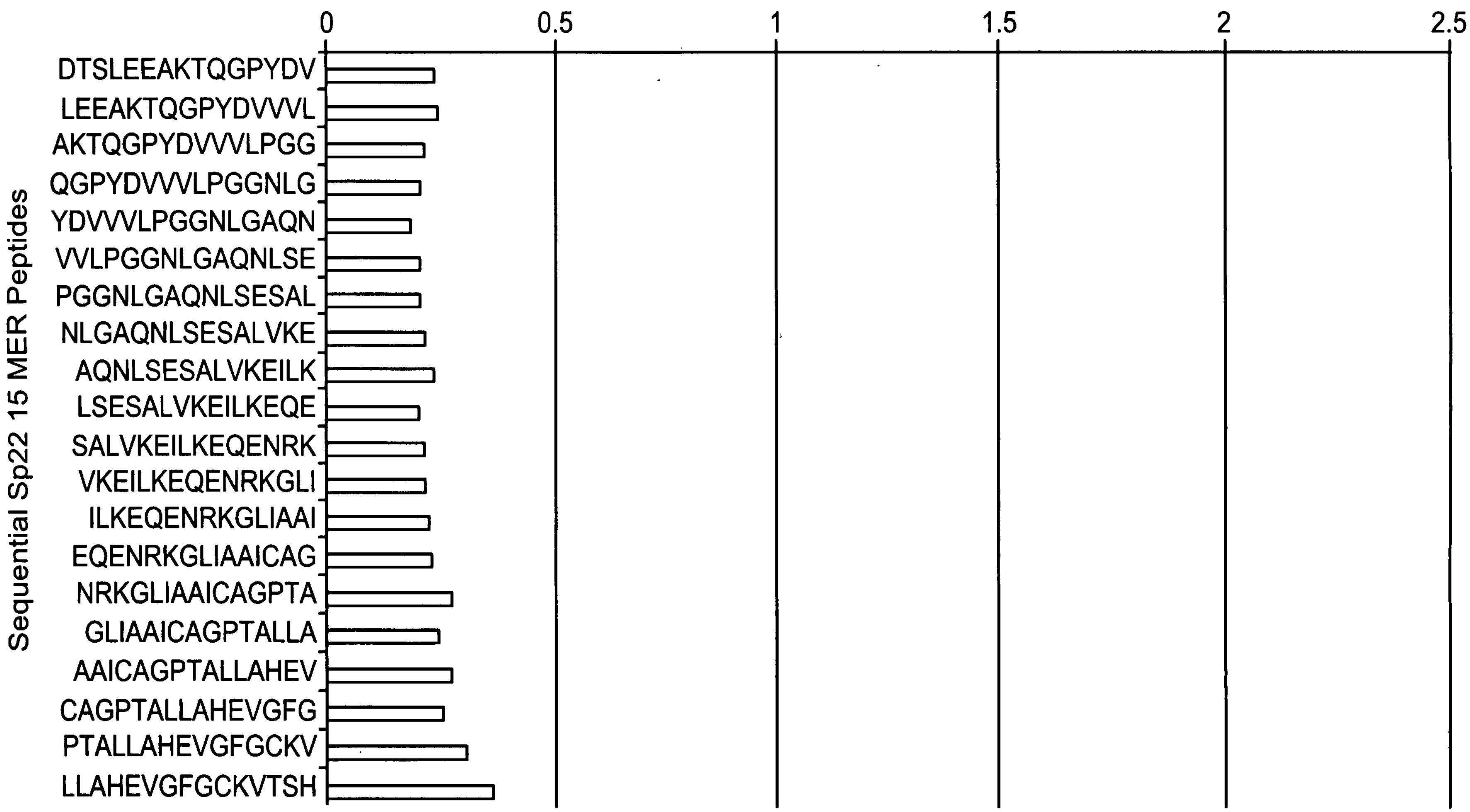
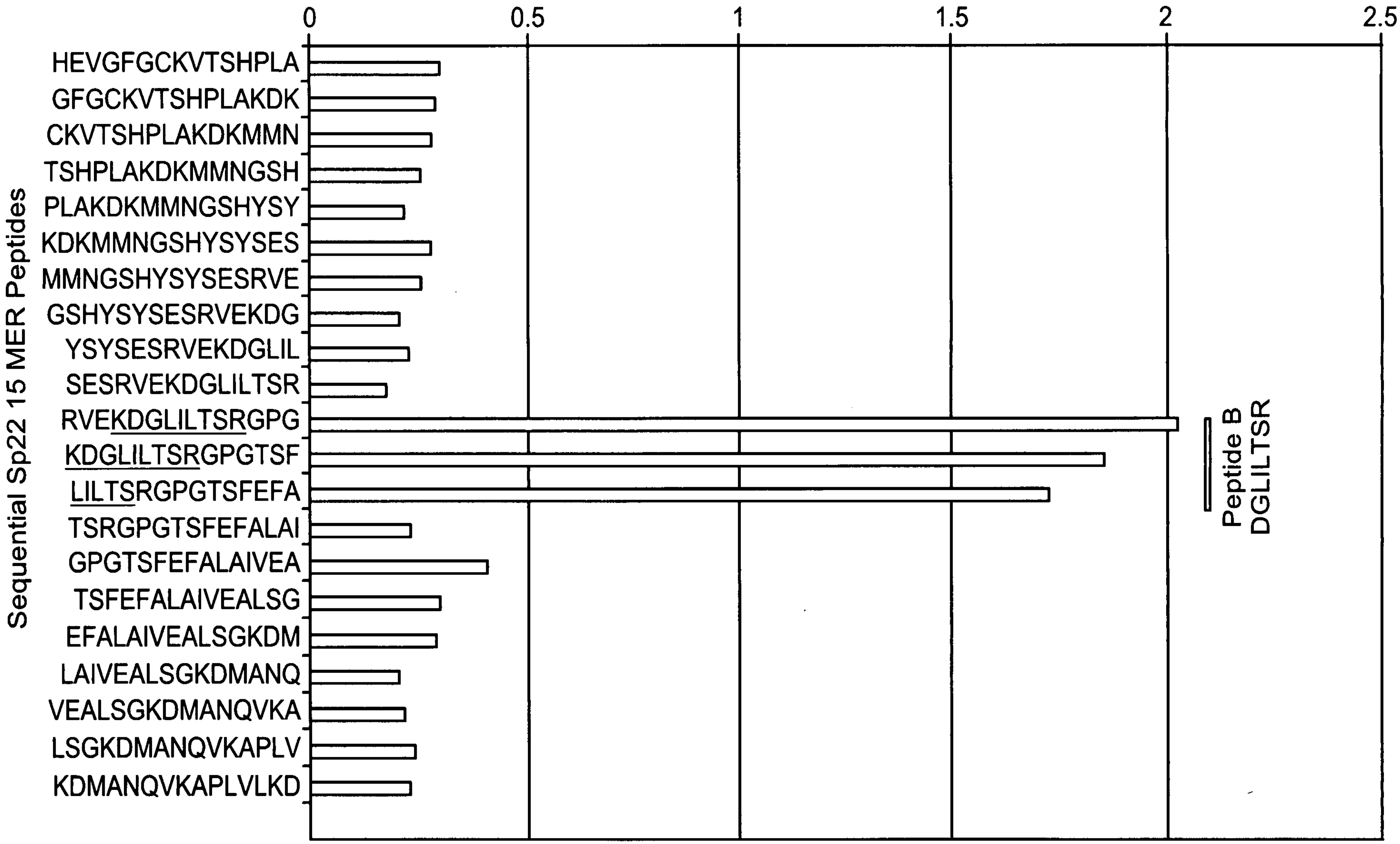

Sequential Sp22 15 MER Peptides
0
0.5
1
1.5
2
2.5
DTSLEEAKTQGPYDV
LEEAKTQGPYDVVVL
AKTQGPYDVVVLPGG
QGPYDVVVLPGGNLG
YDVVVLPGGNLGAQN
VVLPGGNLGAQNLSE
PGGNLGAQNLSESAL
NLGAQNLSESALVKE
AQNLSESALVKEILK
LSESALVKEILKEQE
SALVKEILKEQENRK
VKEILKEQENRKGLI
ILKEQENRKGLIAAI
EQENRKGLIAAICAG
NRKGLIAAICAGPTA
GLIAAICAGPTALLA
AAICAGPTALLAHEV
CAGPTALLAHEVGFG
PTALLAHEVGFGCKV
LLAHEVGFGCKVTSH

FIG. 8-2



Sequential Sp22 15 MER Peptides
HEVGFGCKVTSHPLA
GFGCKVTSHPLAKDK
CKVTSHPLAKDKMMN
TSHPLAKDKMMNGSH
PLAKDKMMNGSHYSY
KDKMMNGSHYSYSES
MMNGSHYSYSESRVE
GSHYSYSESRVEKDG
YSYSESRVEKDGLIL
SESRVEKDGLILTSR
RVEKDGLILTSRGPG
KDGLILTSRGPGTSF
LILTSRGPGTSFEFA
TSRGPGTSFEFALAI
GPGTSFEFALAIVEA
TSFEFALAIVEALSG
EFALAIVEALSGKDM
LAIVEALSGKDMANQ
VEALSGKDMANQVKA
LSGKDMANQVKAPLV
KDMANQVKAPLVLKD
0
0.5
1
1.5
2
2.5
Peptide B
DGLILTSR


FIG. 8-3

**Fig. 9**

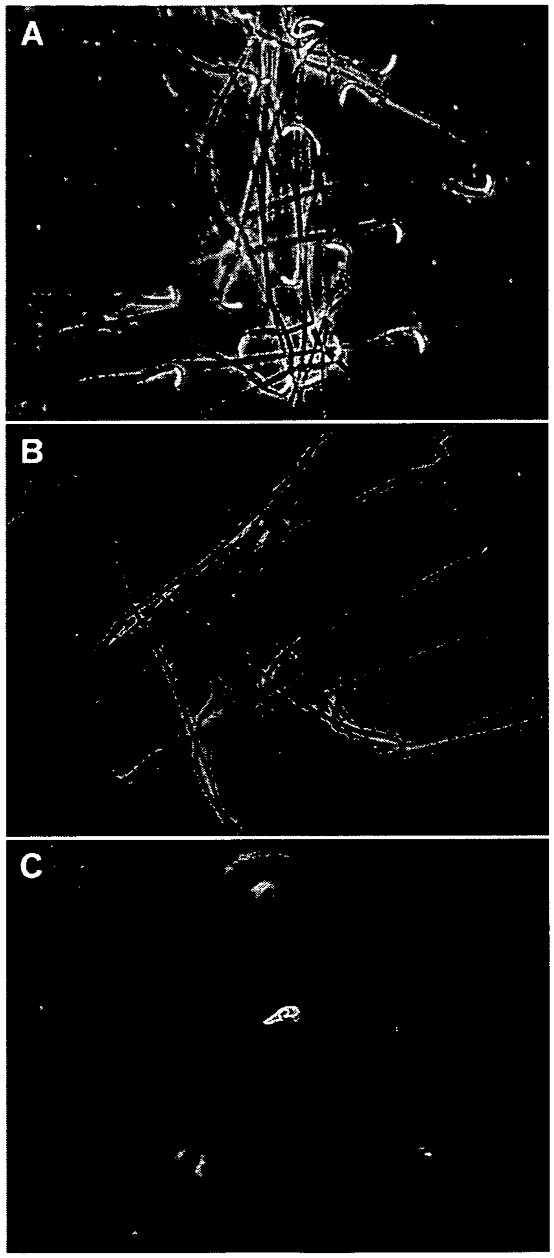


**Fig. 10**

A

B

C

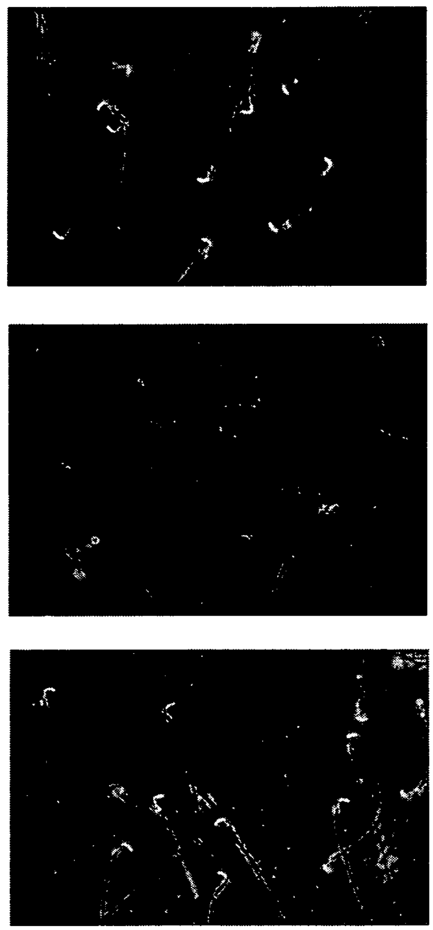
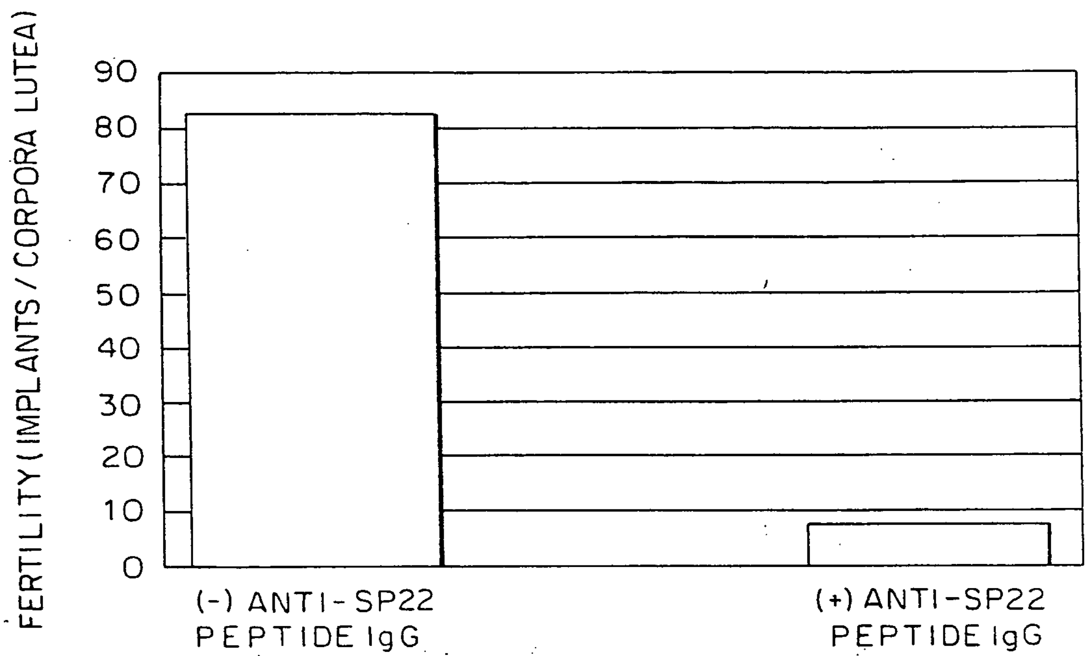


FIG. 11



FERTILITY (IMPLANTS / CORPORA LUTEA)
90
80
70
60
50
40
30
20
10
0
(-) ANTI-SP22 PEPTIDE IgG
(+) ANTI-SP22 PEPTIDE IgG

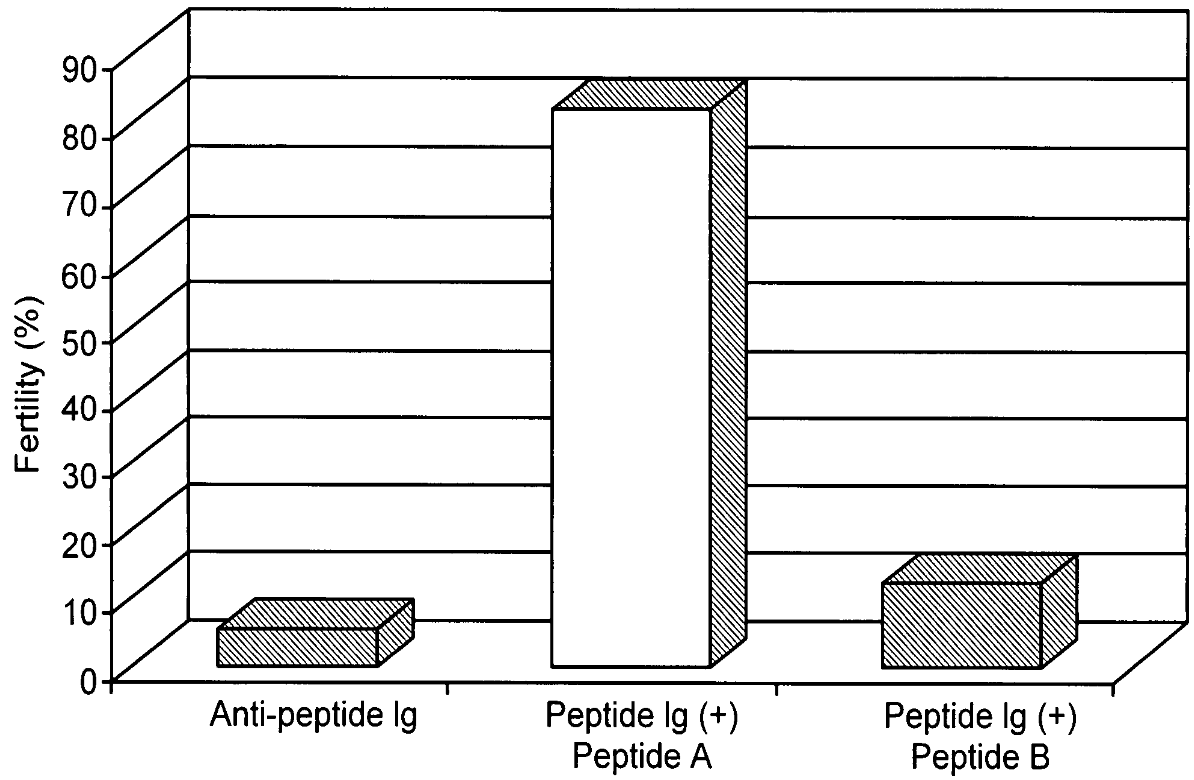

Fertility (%)
0
10
20
30
40
50
60
70
80
90
Anti-peptide Ig
Peptide Ig (+)
Peptide A
Peptide Ig (+)
Peptide B

FIG. 12

| |
|---|
| FIG. 13-1 |
| FIG. 13-2 |
| FIG. 13-3 |

FIG. 13

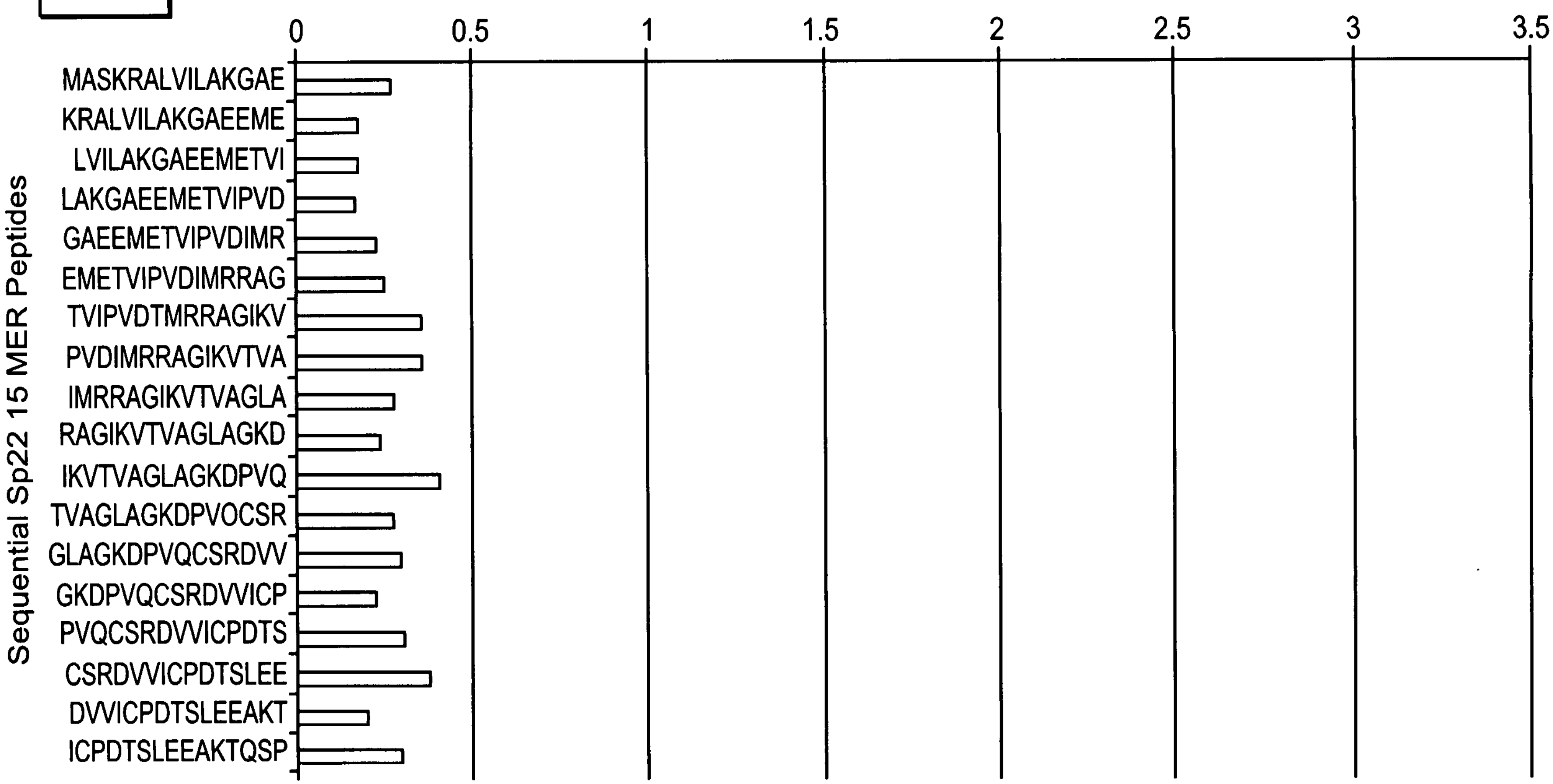
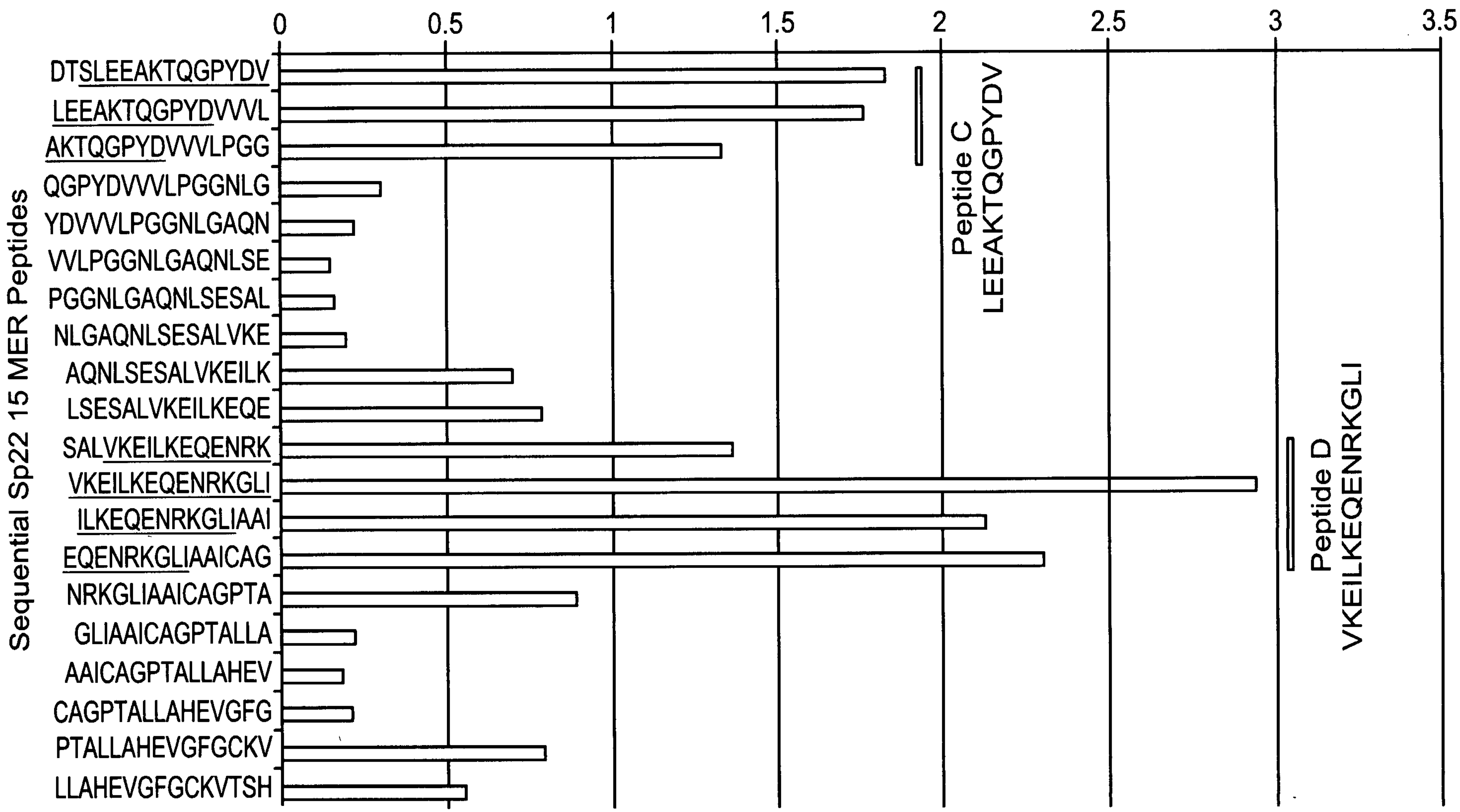



FIG. 13-1



Sequential Sp22 15 MER Peptides
0
0.5
1
1.5
2
2.5
3
3.5
DTSLEEAKTQGPYDV
LEEAKTQGPYDVVVL
AKTQGPYDVVVLPGG
QGPYDVVVLPGGNLG
YDVVVLPGGNLGAQN
VVLPGGNLGAQNLSE
PGGNLGAQNLSESAL
NLGAQNLSESALVKE
AQNLSESALVKEILK
LSESALVKEILKEQE
SALVKEILKEQENRK
VKEILKEQENRKGLI
ILKEQENRKGLIAAI
EQENRKGLIAAICAG
NRKGLIAAICAGPTA
GLIAAICAGPTALLA
AAICAGPTALLAHEV
CAGPTALLAHEVGFG
PTALLAHEVGFGCKV
LLAHEVGFGCKVTSH
Peptide C
LEEAKTQGPYDV
Peptide D
VKEILKEQENRKGLI


FIG. 13-2

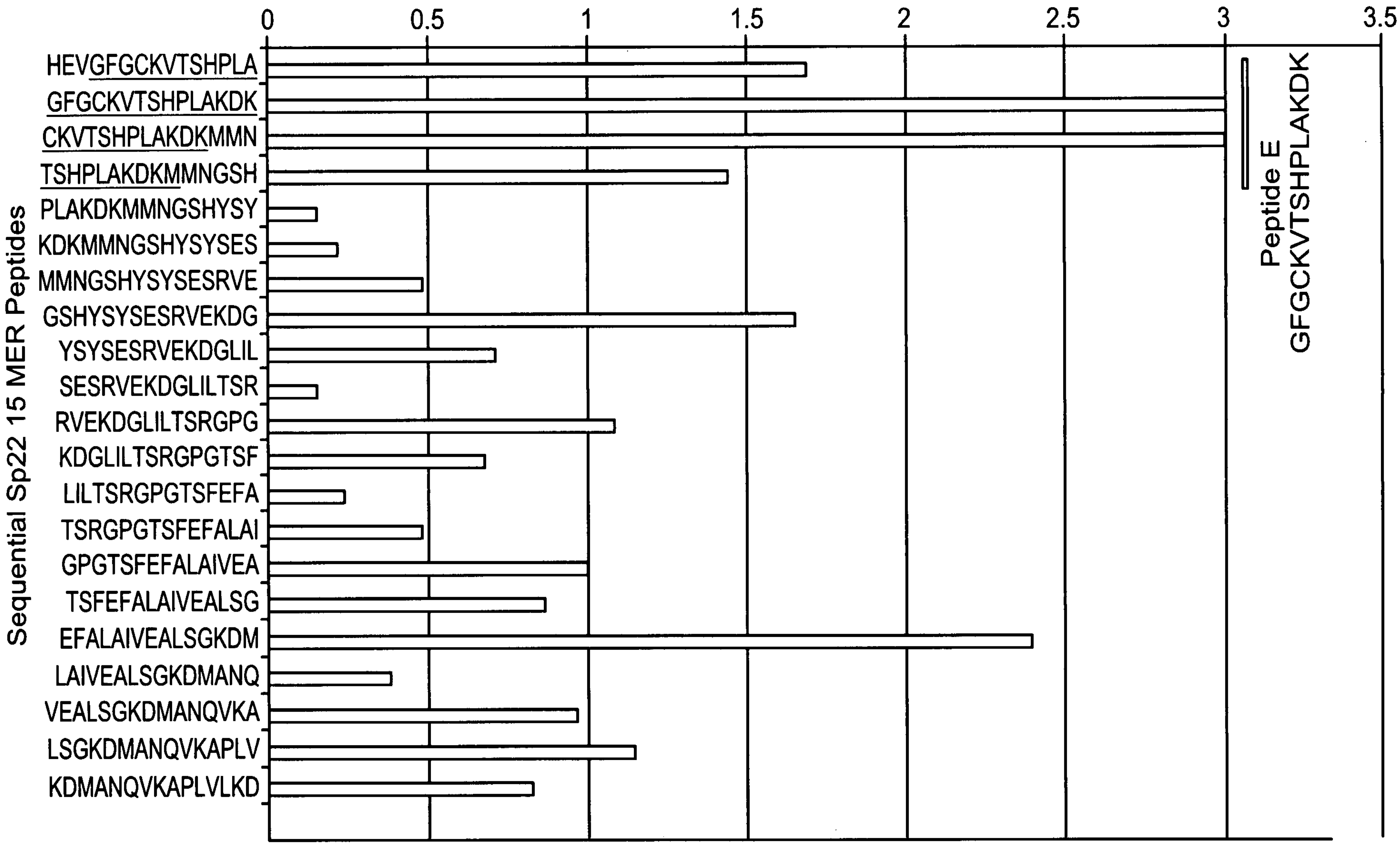
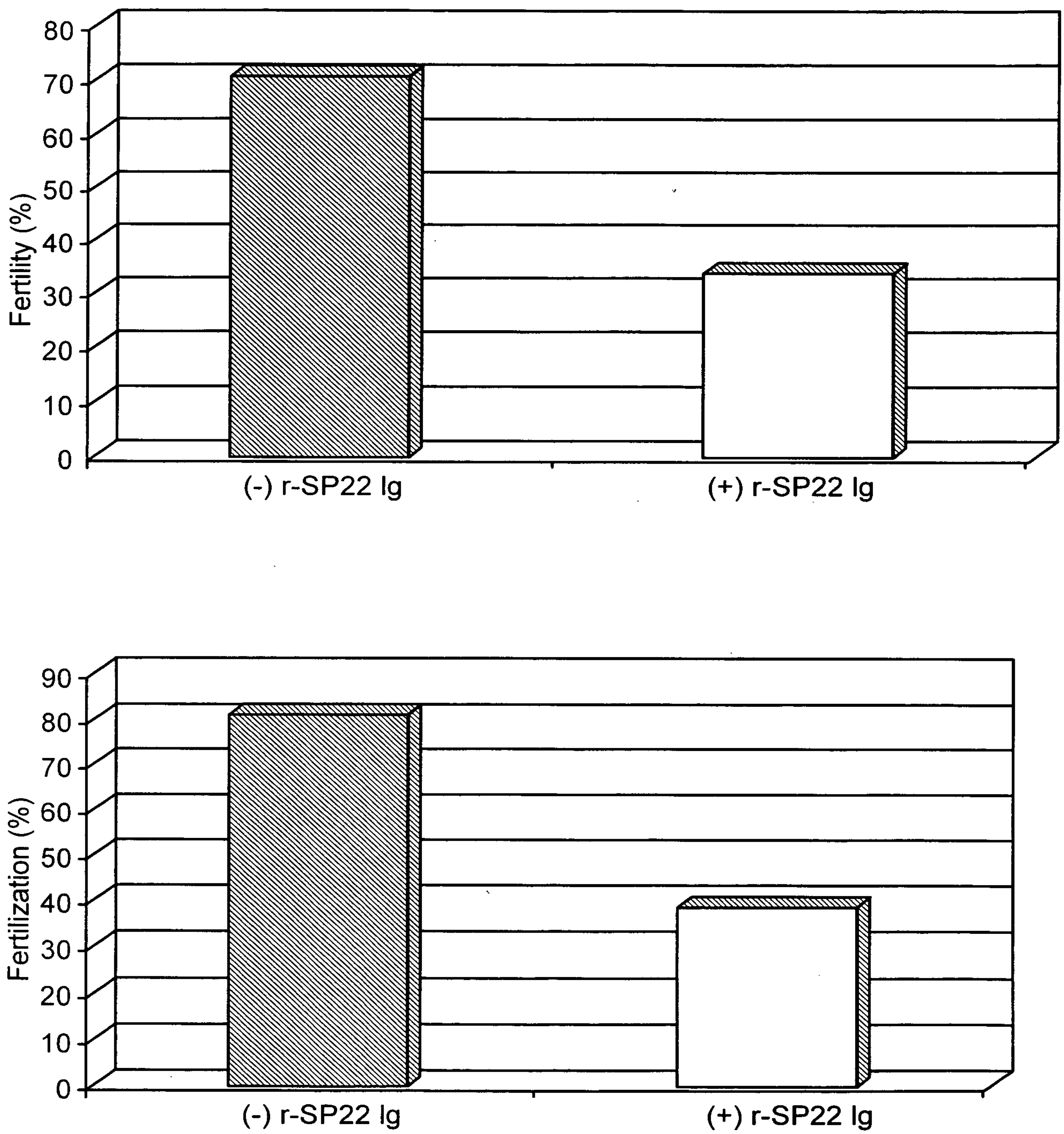

Sequential Sp22 15 MER Peptides
HEVGFGCKVTSHPLA
GFGCKVTSHPLAKDK
CKVTSHPLAKDKMMN
TSHPLAKDKMMNGSH
PLAKDKMMNGSHYSY
KDKMMNGSHYSYSES
MMNGSHYSYSESRVE
GSHYSYSESRVEKDG
YSYSESRVEKDGLIL
SESRVEKDGLILTSR
RVEKDGLILTSRGPG
KDGLILTSRGPGTSF
LILTSRGPGTSFEFA
TSRGPGTSFEFALAI
GPGTSFEFALAIVEA
TSFEFALAIVEALSG
EFALAIVEALSGKDM
LAIVEALSGKDMANQ
VEALSGKDMANQVKA
LSGKDMANQVKAPLV
KDMANQVKAPLVLKD
0
0.5
1
1.5
2
2.5
3
3.5
Peptide E
GFGCKVTSHPLAKDK

FIG. 13-3



Fertility (%)
80
70
60
50
40
30
20
10
0
(-) r-SP22 Ig
(+) r-SP22 Ig
Fertilization (%)
90
80
70
60
50
40
30
20
10
0
(-) r-SP22 Ig
(+) r-SP22 Ig


FIG. 14

FIG. 15

1 xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxatggcatccaaaagagctctggtcatc 66

1 X X X X X X X X X X X X X M A S K R A L V I 22

67 ctagccaaaggagcagaggagatggagacagtgattcctgtggacatcatgcggcgagctgggatt 132

23 L A K G A E E M E T V I P V D I M R R A G I 44

133 aaagtcaccgttgcaggcttggctgggaaggaccccgtgcagtgtagccgtgatgtagtgatttgt 198

45 K V T V A G L A G K D P V Q C S R D V V I C 66

199 ccggataccagtctggaagaagcaaaaacacagggaccatacgatgtggttgttcttccaggagga 264

67 P D T S L E E A K T Q G P Y D V V V L P G G 88

265 aatctgggtgcacagaacttatctgagtcggctttggtgaaggagatcctcaaggagcaggagaac 330

89 N L G A Q N L S E S A L V K E I L K E Q E N 110

331 aggaagggcctcatagctgccatctgtgcgggtcctacggccctgctggctcacgaagtaggcttt 396

111 R K G L I A A I C A G P T A L L A H E V G F 132

397 ggatgcaaggttacatcgcacccattggctaaggacaaaatgatgaacggcagtcactacagctac 462

133 G C K V T S H P L A K D K M M N G S H Y S Y 154

463 tcagagagccgtgtggagaaggacggcctcatcctcaccagccgtgggcctgggaccagcttcgag 528

155 S E S R V E K D G L I L T S R G P G T S F E 176

528 tttgcgctggccattgtggaggcactcagtggcaaggacatggctaaccaagtgaaggccccgctt 594

177 F A L A I V E A L S G K D M A N Q V K A P L 198

595 gttctcaaagactagagagcccaagccctggaccctggacccccaggctgagcaggcattggaagc 660

199 V L K D * 202

661 ccactagagagaccacagcccagtgaacctggcattggaagcccactagtgtgtccacagcccagt 726

727 gaacctcaggaactaacgtgtgaagtagcccgctgctcaggaatctcgccctggctctgtactatt 792

793 ctgagccttgctagtagaataaacagttccccaagctc 830

FIG. 16

```
1    gctgtgcagagccgtctggcagggttgacctcctaaaggatattccatctttattaatcattag 65
66   tagtgtggtcagagacttagcaccattggtctcccccaacctggtccagacatttcagcagttta 130
131  tcggaacagcaacaacagcaacaaaaccttcaaaatttacaagtctttaagaaatagaaATGgca 195
1                                                                 M  A 2
196  tccaaaagagctctggtcatcctagccaaaggagcagaggagatggagacagtgattcctgtgga 260
3     S  K  R  A  L  V  I  L  A  K  G  A  E  E  M  E  T  V  I  P  V  D 24
261  caccatgcggcgagctgggattaaagtcaccgttgcaggcttggctgggaaggaccccgtgcagt 325
25    I  M  R  R  A  G  I  K  V  T  V  A  G  L  A  G  K  D  P  V  Q  45
326  gtagccgtgatgtagtgatttgtccggataccagtctggaagaagcaaaaacacagggaccatac 390
46   C  S  R  D  V  V  I  C  P  D  T  S  L  E  E  A  K  T  Q  G  P  Y 67
391  gatgtggttgttcttccaggaggaaatctgggtgcacagaacttatctgagtcggctttggtgaa 455
68    D  V  V  V  L  P  G  G  N  L  G  A  Q  N  L  S  E  S  A  L  V  K 89
456  ggagatcctcaaggagcaggagaacaggaagggcctcatagctgccatctgtgcgggtcctacgg 520
90    E  I  L  K  E  Q  E  N  R  K  G  L  I  A  A  I  C  A  G  P  T  110
521  ccctgctggctcacgaagtaggctttggatgcaaggttacatcgcacccattggctaaggacaaa 585
111  A  L  L  A  F  E  V  G  F  G  C  K  V  T  S  H  P  L  A  K  D  K 132
586  atgatgaacggcagtcactacagctactcagagagccgtgtggagaaggacggcctcatcctcac 650
133   M  M  N  G  S  H  Y  S  Y  S  E  S  R  V  E  K  D  G  L  I  L  T 154
651  cagccgtgggcctgggaccagcttcgagtttgcgctggccattgtggaggcactcagtggcaagg 715
155   S  R  G  P  G  T  S  F  E  F  A  L  A  I  V  E  A  L  S  G  K  175
716  acatggctaaccaagtgaaggccccgcttgttctcaaagacTAGagagcccaagccctggaccct 780
176  D  M  A  N  Q  V  K  A  P  L  V  L  K  D                         189
781  ggacccccaggctgagcaggcattggaagcccactagtgtgtccacagcccagtgaacctggcat 845
846  tggaagcccactagtgtgtccacagcccagtgaacctcaggaactaacgtgtgaagtagcccgct 910
911  gctcaggaatctcgccctggctctgtactattctgagccttgctagtagaataaacagttcccca 975
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